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CONTENTS

1. Gas Industry 137

2. Appliances 138

3. Combustion and Industrial Furnaces 139

4. Carbonization and Gasification 140

5. Natural Gas and Natural Gas Condensates 142

6. Petroleum and Synthetic Liquid Fuels 144

7. Analytical Methods and Tests 145

8. General and Physical Chemistry 148

9. Organic Chemistry 148

10. Chemical Engineering 149

11. Process Equipment and Instrumentation 150

12. Materials of Construction 151

13. New Books 152

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1. GAS INDUSTRY

Federal Control

Linz, B. F. GAS CONTROL EXPANDED. *Oil Gas J.*, 53, 94-95 (1954) June 14.

The Supreme Court last week opened up a new broad segment of the natural-gas industry to Federal Power Commission control. The court affirmed a decision of the District of Columbia Court of Appeals holding that Phillips Petroleum Co. is a natural-gas company subject to FPC jurisdiction so far as its interstate gas sales are concerned. The decision puts sales to inter-state pipeline companies by some 2,300 independent producers under federal regulation —in theory, at least. Author's Abstract

Ralph, H. D. INDUSTRY ASKS: WHAT'S NEXT? . . . FPC EXPECTED TO MOVE SLOWLY. *Oil Gas J.*, 53, 95-97 (1954) June 14.

Problems involved and probable procedure by the FPC in acting on regulation of natural gas producers are discussed. D. M. Mason

Fuel Competition

AN ANSWER TO THE "BELTSVILLE TESTS"—THE FACTS ABOUT LP-GAS VS. ELECTRIC COOKING. *LP-Gas*, 14, 49-56 (1954) May.

This article presents the LP-gas rebuttal to T.B.-1073 of the Bureau of Agriculture. Among the points brought out are: payment of at least $15,000 by N.E.M.A. for these tests, the regulation of electric supply voltage (never encountered in practice), and handicap of LP appliances by substandard pressure regulation. Again the question is raised of why did a government bureau cooperate in a set of tests biased to favor electrical appliances? But even with controlled supply voltage the electric ranges were outdone every time by gas.
R. T. Ellington

COAL SEEKS "END USE" CONTROLS ON OIL. *Nat. Petroleum News*, 46, 15, 16 (1954) May 5.

John L. Lewis and a group of coal state governors are agitating for further government control in the fuel industry. They want a national fuel policy which will regulate oil to mobile plant uses and will reserve stationary plants and heating for coal. Principal points of attack were imports of foreign residuals and the 15% depletion allowance for coal versus 27.5% allowance received by the oil industry.
R. T. Ellington

HOW OIL HEAT CAN LICK THE GAS THREAT. *Nat. Petroleum News*, 46, 27, 31 (1954) May 5.

An account is given of the coordinated effort of Baltimore oil dealers to present loss of their heating customers to natural gas. This advertising attack was based on lower cost for oil, cleanliness, good service and imminent price increases for gas. The attack has been sufficiently successful to block an electric rate increase sought by Consolidated by arguing gas costs were being shunted to electric users.
R. T. Ellington

Utility Information

Collins, J. H. WHAT ARE 78,000 EMPLOYEES WILLING TO READ? *Public Utilities Fortn.*, 53, 807-14 (1954) June 24.

Pacific Telephone has recently completed an experiment in booklet rack service to its employees which has proved interesting and worthwhile. The racks included books on the four general subjects of: home and hobby; health and safety; Americanism and economics and the Bell system. Questionnaires submitted showed 95 percent approval and 90 percent recommendation for continuation. The company is now putting out a new booklet every week, covering the three broad classifications—better living; educational and company. As to costs, such service compares well, in dollars, with an employee magazine and has the added advantage of an entirely different kind of employee-company contact job. C. A. Simms

Holmwood, H. W. A UTILITY PROGRAM FOR THE TEACHER. *Public Utilities Fortn.* 53, 799-806 (1954) June 24.

General Telephone Company of California invited about eight or twelve high school teachers to attend a two-day conference with the company's officers and department heads. Informal discussions were held in which all phases of the telephone business were discussed. High school

teachers were chosen because the company felt they were closer to the home and were in a better position to influence the community. The company felt that since teachers talk about the telephone company to their students they should know the facts. Company people say that the experience is valuable to them, because it makes them do some thinking about the phases of their own jobs which they might not otherwise take time to do, and the teachers are impressed by the fact that the president of the company and department heads will participate in such a conference and are not afraid to answer any questions asked of them.

C. A. Simms

2. APPLIANCES

Air Conditioning

Hay, A. D. SUMMER DESIGN TEMPERATURES. *Heating, Piping and Air Conditioning*, 26, 118-121 (1954) June.

It is obviously uneconomical to base the design of an air conditioning system for a given location on the highest unit-dry bulb conditions on record. This article presents information on the occurence frequency of various conditions in selected cities along with a method of estimating the per cent of the time per year a given set of conditions will occur. With this probability information and the as yet undetermined daily duration characteristics of various design conditions in various cities a more economical approach to design can be made.

R. T. Ellington

Nottage, H. B., and Parmelee, G. V. CIRCUIT ANALYSIS APPLIED TO LOAD ESTIMATING. *Heating, Piping and Air Conditioning*, 26, 157-166 (1954) June.

A very useful approach to the solution of heat transfer problems involving parallel paths and storage at points on said paths is presented. An electrical analogue for an air conditioning problem is described showing the analysis necessary to determine the thermal circuit and its translation into an electrical circuit. This approach promises to be very productive in analyzing instantaneous loads, peak loads and transient conditions in many heat transfer applications. R. T. Ellington

Smoot, T. H. SOME OF THE THINGS YOU SHOULD KNOW ABOUT HOME COOLING. *Gas Heat*, 5, 29, 82 (1954) May.

Excerpts are presented from an address delivered by the author before the 43rd Annual Convention of the Michigan Heating and Sheet Metal Convention. Some general considerations for dealers about to enter the cooling field are offered on heat loss and gain, servicing, cost of operation of a cooling unit, duct systems, and water supply and requirements. J. F. Reed

Clothes Drier

Sipe, T. L. DRYING AND SEPARATING UNIT. U. S. 2,679,113 (1954) May 25.

A clothes drier is proposed which includes a build-in refrigerant-cooled condenser, and a vacuum pump to remove condensate and reduce pressure in drying chamber. R. T. Ellington

Gas Safety

GAS HAS EXCELLENT FIRE-SAFE RECORD IN LATEST FIGURES, FOR 1952. *Ind. Gas*, 32, 7 (1954) March.

National Fire Protection Association releases of estimates for latest year, 1952, show gas fuel and appliances 18th on list of 24 causes for fires. Electrical causes, including fixed services, misuse, faulty wiring and equipment, were fourth in number of occurrences (55,000) following smoking and matches, defective or overheated heating and cooking equipment, and unknown causes. Electrical power consuming appliances added another 30,500 instances. Gas and appliances, including gas explosions caused only 8,300 fires of the 703,000 instances tabulated.

R. E. Ellington

Heat Storage

Telkes, M. COMPOSITION OF MATTER FOR THE STORAGE OF HEAT. U. S. 2,677,664 (1954) May 4.

Addition of borax to heat-storage solutions of sodium sulfate was found to promote formation of desired deca-hydrate crystals, and to inhibit formation of hepta-hydrate crystals. The borax also prevented super cooling, and acted as a corrosion inhibitor. E. F. Searight

Heating Research

COLEMAN CO. AND WICHITA U. COLLABORATE ON RESEARCH RESIDENCE FOR HEATING DATA. *Amer. Gas J.*, 180, 68, 70 (1954) May.

A research residence has been constructed at Wichita University. It is at present being used for heating and air conditioning tests for Coleman Co. One of the problems being examined is the best method for heating slab-floor houses.

E. F. Searight

3. COMBUSTION AND INDUSTRIAL FURNACES

Air Pollution

Barkley, J. F. ACCEPTED LIMIT VALUES OF AIR POLLUTANTS. U. S. Bur. Mines Inf. Circ. 7682 (1954) May.

Threshold limit values adopted by the American Conference of Government Industrial Hygienists, together with variations adopted by several of the state governments, are tabulated for gases and vapors, mineral dusts, and radiations.

D. M. Mason

SMOKE AND FUMES COMMITTEE. *Petroleum Processing*, 9, 716-717 (1954) May.

Brief descriptions are given of eleven research projects which have been assigned to seven institutions and are designed to develop basic information on the causes of air pollution in urban areas.

D. J. Dennison

Carbon Fission

PUNCH FOR POWER. *Chem. Week*, 74, 19-20 (1954) June 20.

Military technical men are testing a "quantum jump" fission reaction of the carbon in mineral fuels, said to release 78.3 million Btu/lb instead of the usual 10,200 Btu. Two laboratory tests have produced tremendous energy. Control and industrial application require pilot plant studies.

O. P. Brysch

Coal-Gas Turbines

Yellott, J. I. and Broadley, P. R. COAL BURNING GAS TURBINE PROGRESS IN 1953. *Bituminous Coal Research*, 14, 8-12 (1954) April/June; *Combustion*, 25, 55-57 (1954) May.

Recent progress in the Locomotive Development Committee program for developing a coal-burning gas turbine for locomotive use is presented. Successful operation of the direct-fired coal burning gas turbine depends on efficient fly ash separation. Accordingly, the latest development work has emphasized ash separator design and evaluation. The ash separator design has essentially embodied Dunlab tubes with annular blowdown in a multitube arrangement.

E. J. Pyrcioch

Crematorium

Holmquist, J. W. HOW GAS MODERNIZED A CREMATORIUM. *Ind. Gas*, 32, 8, 9 (1954) April.

The much nicer operation secured by converting a 63-year old coke-fired crematorium to natural gas is discussed. The time for an operating cycle was reduced from 32 hours to 3 hours and fuel cost from $12.50 worth of $25.00 coke to $3.50 for 3500 cu ft of gas.

R. T. Ellington

Heat Treating

Smith, A. Q. AIRFRAME PRODUCTION SPEEDED BY GAS. *Ind. Gas*, 32, 11, 20, 21 (1954) April.

Operations at Glenn L. Martin Co., include heat treating of formed aluminum parts in gas-fired sodium nitrate salt baths at 920° F. The bath is externally fired by nozzle-mixing burners directed into refractory screens. Five crucible furnaces are also used in the plant for melting the metals from which forging dies are made.

R. T. Ellington

HEAT TREATING PLAYS A MOST IMPORTANT ROLE IN PRODUCTION OF HOLLOW STEEL PROPELLERS. *Ind. Gas*, 32, 14, 21, 22 (1954) April.

Curtis-Wright constructs its propellors by welding together two formed sheets of steel alloy. After blanking and forming the pieces are annealed in gas-fired pit-type radiant tube muffle sub-critical furnaces with an atmosphere of 6% CO_2, 0.0—O_2, 0.0—Illuminants, 17.2—CO, 10.6-H_2, 0.4-CH_4 and balance N_2. Blade halves are welded together by the automatic atomic hydrogen welding process. The welded blade edges are reinforced by a copper manganese fillet brazed to the steel weld on the inside. With the proper amount of Cu-Mn granules on

the inside the blade edge is fed automatically between two groups of gas-fired radiant cup burners. Controlled atmosphere rotary pit furnaces are used to harden the blades, and other gas-fired equipment is used in many operations on hub and gear assembly as well as the final chrome plating operation.

R. T. Ellington

4. CARBONIZATION AND GASIFICATION

Carbonization

Dupré, L. M. DEVICE TO PACK COAL IN COKE OVENS. U. S. 2,676,915 (1954) April 27.

Improved coke is obtained by better compaction of the charge of coal fines, either in the coke oven or in the stamping machine. The coal is subjected to mechanical vibration, transmitted by a series of rods which are controllably supported (in vertical or horizontal position) upon a frame movable from oven to oven.

O. P. Brysch

Welinsky, I. H. (assigned to Pittsburgh Consolidation Coal Co.) CARBONIZATION OF AGGLOMERATIVE COALS. U. S. 2,677,650 (1954) May 4.

Agglomerating coals, such as Pittsburgh Seam, are carbonized in a fluidized bed by direct contact with a portion of previously carbonized char which has been heated by direct combustion in a separate zone to 1400° F. To prevent agglomeration of the charge at this stage, the coal entering has been heated and diluted with a second portion of carbonized char.

O. P. Brysch

Coal Classification

DIE INTERNATIONALE KLASSIFIKATION DER STEINKOHLEN (THE INTERNATIONAL CLASSIFICATION OF BITUMINOUS COALS.)

Demann, W. I. EINFUEHRENDE BEMERKUNGEN. (INTRODUCTORY OBSERVATIONS). *Brennstoff-Chemie* (German) 35, 129-30 (1954) May 19.

The importance of international agreement in the European coal trade is discussed, with a brief review of efforts of the International Organization for Standardization Technical Committee (ISO/TC 27) on Solid Mineral Fields to develop a classification scheme based on accepted coal properties.

Radmacher, W. II. GRUNDLAGEN DES VORGESCHLAGENEN INTERNATIONALEN STEINKOHLEN-KLASSIFIKATIONSSYSTEMS. (BASIS FOR THE ACCEPTED INTERNATIONAL SYSTEM OF COAL CLASSIFICATION). *Brennstoff-Chemie* (German) 35, 130-36 (1954) May 19.

A comparison of 9 national systems of coal classification is shown by tabulations, and the method of coordinating the corresponding properties and criteria into a scientific, and then a commercial classification is shown. The ISO/TC 27 system with designation of particular coals by a class : group : subgroup "Index Number" is explained and its application to German coals is outlined.

Mantel, W. III. DIE FUER DIE "INTERNATIONALE STEINKOHLEN-KLASSIFIKATION" ERFORDERLICHEN UNTERSUCHUNGSVERFAHREN MIT ANWENDUNGSBEISPIELEN. (TEST PROCEDURES FOR THE INTERNATIONAL CLASSIFICATION OF BITUMINOUS COALS AND EXAMPLES OF APPLICATION). *Brennstoff-Chemie* (German), 35, 136-43 (1954) May 19.

The several national standard procedures for volatile matter, swelling index and coking index are given with details of manipulation, apparatus, and interpretation of results for fitting a coal into the ISO/TC 27 classification.

O. P. Brysch

Coal Gasification

Grossman, P. R. and Curtis, R. W. PULVERIZED-COAL-FIRED GASIFIER FOR PRODUCTION OF CARBON MONOXIDE AND HYDROGEN. *Amer. Soc. Mech. Eng. Trans.*, 76, 689-695 (1954) May.

This paper describes a pilot-plant pulverized-coal gasifier installed at the Morgantown Station of the Bureau of Mines and a semicommercial gasifier of similar design installed at the E. I. du Pont de Nemours & Company, Inc., Belle, West Virginia. A brief summary of the operating data obtained from these two units is presented and material requirements are

given for this method of coal gasification. A large size unit of this design is now under construction and will go into operation next year. This will be the first commercial application of the process in this country. Details of the design that provide for handling of coal ash of widely varying fusing temperatures are given in an effort to point out those features which have contributed to continuous uninterrupted operation. Included also is a discussion of heat flow within the gasification unit to illustrate the factors involved in obtaining an economical process. Authors' Abstract

Coking Practise

Cellan-Jones, G., Steding, A. and Veit, P. CONTINENTAL COKING PRACTICE. *Gas World* (British), 139 Suppl. 117-21, 124 (1954) June 5.

Latest developments in Continental coking practice are reviewed with emphasis on the ovens and equipment of the Didier-Kogag-Hinselmann Co. (Essen). Features of the half-divided, multi-celled regenerator oven and its operation are sketched and further explained in the discussion. The low heat consumption of 891 Btu/lb coal carbonized has been attained on rich-gas fuel and 10% moisture coals. Detarring, H_2S removal and light oil recovery and use of oiled charges are outlined.

O. P. Brysch

Crushing

Taylor, J. THE FINE CRUSHING OF COAL AND COKE. *J. Inst. Fuel* (British) 249-54 (1954) May.

The application of known size-distribution expressions to the products of crushing operations is examined. A distinction is made between coarse crushing, in which "residue" and "complement" fractions are produced, and fine crushing, in which the product is all "complement". A further distinction is drawn between solids having a porous or granular structure and those which are homogeneous from the point of view of breakage, e.g. glass, coal, clay, etc. Only the latter can be expected to give break-down products with a simple size grading and then only in certain fine-crushing operations. The conditions of breakdown leading to various types of grading are then considered with particular reference to coal and coke. Finally, these conditions are related to the degree of dispersion in the crushed product, which in turn is the most important factor in the packing density. Author's Abstract

Extraction of Coal

Ruidisch, L. E. and Pevere, E. F. (assigned to The Texas Co.) EXTRACTION OF COAL. U. S. 2,681,300 (1954) June 15.

A process of treating coal to recover liquid constituents by digesting the coal in the presence of a solvent at superatmospheric pressure and elevated temperature is described.

D. J. Dennison

Gas Producer Safety

van Ackeren, P. (assigned to Koppers Co., Inc.) SAFETY DEVICE FOR GAS PRODUCERS. U. S. 2,680,064 (1954) June 1.

The patent describes a safety device for gas producers consisting of a shut-off valve which is kept closed by the forced draft and is located a branch of the main gas line leading to the atmosphere. E. J. Pyrcioch

H_2S Removal

Bolzinger, M. A. CONDUITE DES ÉPURATEURS CLASSIQUES À OXYDE DE FER. (CONTROL OF REGULAR PURIFIERS USING IRON OXIDE. *J. Usines Gaz*, (French) 78, 74-81 (1954) March; 128-134 (1954) April.

This two-part article presents the more recently reported results of English and French gas engineers on the operation of iron-oxide gas purifiers. First, postulating acceptable operation as the greatest throughput of gas with the least pressure-drop and with the lowest cost (labor) of sulfur saturation of the bed, the theoretical factors which govern premature loss of activity and hardening of the bed are discussed. Most important are non-sulfur impurities, sponge humidity and temperature, purification reactions and heat dissipation, and humidity control by heating or steaming, which are discussed in relation to maintaining uniformity of activity in beds and in multiple boxes by proper sequences of direct or reversed flow of gas. Secondly, the principles concerning the above factors are applied to the practical design

and management of oxide charges for simple and tower-type purifiers. A sample calculation and 17 references are given.

O. P. Brysch

Hydrocarbon Gasification

Hecker, E. and Michel, E. ERZEUGUNG VON NORMGERECHTEM STADTGAS DURCH KATALYTISCHES KRACKEN VON PROPAN, ERDGAS UND HEIZOELEN. (PRODUCTION OF SPECIFICATION CITY GAS BY CATALYTIC CRACKING OF PROPANE, NATURAL GAS AND HEAVY OILS). *Gas- und Wasserfach* (German), 95, 6-10 (1954) January 1.

A comprehensive review is presented of catalytic cracking plants in France employing such feed stocks as natural gas, propane and heavy oil.

H. R. Linden

Long, R. OIL GASIFICATION. *Chem. Process Eng.* (British), 35, 169-172 (1954) June.

Oil gasification processes are reviewed, including cyclic high and low Btu oil gas processes, partial combustion processes and more British and French cyclic catalytic cracking processes.

H. R. Linden

Mexican Coal

Toron, L. and Cortes-Obregen, S. EXPLORATION OF THE OAXACA COAL FIELDS IN SOUTHERN MEXICO. *Mining Eng.*, 6, 505-509 (1954) May.

The Oaxaca coal fields, outcropping over 3125 square miles about 120 miles south of Mexico City, show considerable promise as a source of metallurgical coal. A study of a selected 120,000 acres in the Tezoatlán Consuelo and the Mixtepec areas show a 100-million ton reserve of semi-anthracite and medium-volatile bituminous coals respectively, of Jurassic age. The seams, of 5 to 7 feet thickness are of 20% to 30% ash content, but can be washed readily in fine sizes.

O. P. Brysch

Water Gas Equilibrium

Graven, W. M. and Long, F. J. KINETICS AND MECHANISMS OF THE TWO OPPOSING REACTIONS OF THE EQUILIBRIUM $CO + H_2O = CO_2 + H_2$. *J. Amer. Chem. Soc.*, 76, 2602-2607 (1954) May 20.

The rate of CO_2 formation in the forward direction and the rate of H_2O formation in the reverse direction for the homogeneous reaction $CO + H_2O = CO_2 + H_2$ was studied at 800 mm total pressure and 600° to 900° C. in a quartz tube flow reactor operating at steady state conditions. The apparent order of the reaction with respect to a given reactant was determined by varying its partial pressure by nitrogen dilution while maintaining a constant partial pressure of all other components. The experimental rates are correlated with equations. The experimental rate equations are shown to be consistent with a homogeneous chain mechanism, for both forward and reverse reactions, involving the chain propagating steps $OH + CO = H + CO_2$ and $H + H_2O + OH + H_2$, initiation by hydrogen and steam dissociation and termination by atom and atom-radical re-combination.

C. G. von Fredersdorff

Synthesis Gas

Corner, E. S. (assigned to Standard Oil Development Co.) PRODUCTION OF INDUSTRIAL GASES CONTAINING CARBON MONOXIDE AND HYDROGEN. U. S. 2,678,264 (1954) May 11.

A synthesis gas containing carbon monoxide and hydrogen is produced from gaseous hydrocarbons in a fluidized unit employing iron oxide as the oxidizing medium.

E. J. Pyrcioch

5. NATURAL GAS AND NATURAL GAS CONDENSATES

Calorific Control

Farmer, G. C. GAS CALORIFIC VALUE CONTROL. (Part 2). *Gas J.* (British) 278, 299-302 (1954) May 5.

A discussion of various instruments and systems of use in controlling the heating value of gas for distribution.

R. F. Bukacek

Fudge, O. P. AUTOMATIC CONTROL OF CALORIFIC VALUE. *Nat. Gas Bull.* (Aus-

tralia) 17, 14-16, 18-20 (1954) January-February.

This article reveals the construction, general theory and operation of an all electric calorific value controller which was built by the Laboratory of the Gas and Fuel Corporation of Victoria and has been in operation for many months thereby eliminating the uncertainty of the calorific value over a given period.

S. Volchko

Construction Procedures

Vivian, C. H. CONSTRUCTION ON THE MOVE. *Compressed Air*, 59, 154-160 (1954) June.

A brief history of gas and oil transmission is given; also the growth of the H. C. Price Co., a pipe line constructor, is treated, revealing the operations in constructing a pipe line.

S. Volchko

Distribution Pressures

Jorgensen, E. M. EFFECT OF HEATING LOAD ON PRESSURES. *Gas Age*, 113, 35-36 (1954) May 6.

The Arizona Public Service Co. operates its distribution system on a fixed pressure basis, maintaining a pressure of 15 to 25 psig by careful regulation at many points in the grids. It is very important to anticipate weather changes for satisfactory operation of a system in this manner, because in a fixed pressure system the pressure curve follows the temperature curve very closely.

B. E. Eakin

Dust Removal

Dennis, R., First, M. W. and Silverman, L. DUST COLLECTORS TESTS IN FIELD. *Chem. Eng.*, 61, 187-189 (1954) May.

Results of field tests an low voltage electrostatic precipitators and collectors in actual operation. Data are presented for design purposes.

G. V. Vosseller

Hedberg, C. W. and Wintermute, H. A. (assigned to Research Corp.) FLY ASH RECOVERY. U. S. 2,677,434 (1954) May 4.

The efficiency of removal of fly ash from combustion gases by electric precipitators is claimed to be increased by the addition of pulverized coal particles to the gases before they enter the precipitator.

E. J. Pyrcioch

Italian Gas Industry

Böhm, A. NATURAL GAS AND THE ITALIAN GAS INDUSTRY. Instn. Gas Engrs. (London) Publ. No. 444, 15 pp, May 31, 1954; *Gas World* (British), 139, 1699-1703 (1954) June 19; *Gas Times* (British) 79, 547, 58, 60, 62, 63 (1954) June 18; *Gas J.* (British) 278, 787-91 (1954) June 16.

The Italian gas industry is faced with the problem of how best to utilize their increasing available supply of natural gas. Most existing distribution systems are designed for a 350-400 Btu/scf manufactured gas, so that a conversion to straight natural gas is in general a difficult and expensive operation. This has led to the use of the natural gas as air-methane mixtures, a reformed methane, and for enrichment of town gas.

E. F. Searight

Meter Design

Webb, J. A NEW APPROACH TO METER DESIGN. *Gas*, 30, 37-40 (1954) June.

The high labor cost of meter maintenance, the lack of standardization, extreme over-design of present day meters are cited as reasons to try a new approach to meter design and assembly. Simplification and unitization of components, reduction of capacity to match domestic demands more closely, more compact design, and adaptation to machine and production line fabrication methods would so greatly reduce costs that a meter that becomes defective might readily be discarded, and cheaply replaced.

E. B. Shultz

Natural Gas Liquefaction

Hagen, H. F. (assigned to Union Stock Yards & Transit Co.) REGENERATIVE METHOD AND APPARATUS FOR LIQUEFYING NATURAL GAS. U. S. 2,679,145 (1954) May 25.

This patent pertains to a method of condensing natural gas, recovering work from the gas during the process, for shipping or storing the liquified gas at atmospheric pressure. Gas at

the well-head pressure is expanded thru a multi-stage turbine, and the liquid portion recovered in a separator, the gas being recompressed by compressors driven by the expansion turbines. Necessary additional power for compression is obtained from a gas turbine on the same power shaft as the compressors and the expanders. Operation of this system is predicated on a high well-head pressure. B. E. Eakin

Miller, B. (assigned to The Chemical Foundation, Inc.) TRANSPORTATION OF NATURAL GAS. U. S. 2,677,945 (1954) May 11.

This patent concerns a modification of the low temperature separation of nitrogen from natural gas; this modification is proposed to minimize the methane content of the nitrogen rich product. R. F. Bukacek

Partch, K. P. BARGING NATURAL GAS UP THE MISSISSIPPI. *Gas Age*, 113, 23-24, 74-75 (1954) May 6.

A brief description of the project for shipping liquified natural gas by barge from the Gulf Coast to Chicago. The enterprise proposes to recover part of its refrigeration costs in the sale of refrigeration at Chicago, and claims advantages in safety of operation and an investment cost of about ½ of a comparable pipeline.
R. F. Bukacek

Peak Load Gas

Gaunt, J. A. BUTANE FOR PEAK LOADS. *Gas J.* (British) 278, 47-50, 54 (1954) April 7;

Preparation of suitable peak load gas from butane to meet a 450 Btu standard is described. Experimental blends of butane vapor with blue gas from steamed vertical retorts and producer gas are discussed, with emphasis on gas properties, controls, efficiencies, and costs.
O. P. Brysch

Pipe Line Maintenance

Ledford, R. C. MAINTENANCE OF SUBMARINE PIPE LINES. *Petroleum Eng.*, 26, D91, 92, 94 (1954) May.

A description of the problems involved in the maintenance of submarine pipe lines and some of their solutions. R. F. Bukacek

Deering, R. G. PLASTIC LINERS FOR HIGH-PRESSURE PIPELINES. *Oil Gas J.*, 53, 120-122 (1954) June 14.

Illustrations and procedure of a practical application for lining a pipe with butyrate (thin-wall) plastic tubing which may be installed inside steel welded or screw-coupled lines in place or under construction and has operated up to 980 psi. This tubing may be used in gas or oil lines where corrosion is a problem.
S. Volchko

6. PETROLEUM AND SYNTHETIC LIQUID FUELS

African Plant

THE SASOL OIL-FROM-COAL WORKS: NEW SOUTH AFRICAN PROJECT FOR FUELS AND CHEMICALS. *Chem. and Process Eng.* (Brit.), 35, 153-55 (1954) May; *Oil Gas J.*, 53, 82 (1954) July 19.

This £ 30 million oil-from-coal plant located 50 miles from Johannesburg will have the first units in operation by the middle of 1954 and will be in full production by early 1955. It will produce products at the rate of 71 million Imp gal per year of which 55 million gal will be gasoline, the others consisting of oil, solvents, waxes and other chemicals. Essentially, the process consists of gasifying low-grade coal, purifying the gas and by catalytic synthesis converting the gas to the liquid products. A combination of the German and American Fischer-Tropsch process is used. The plant is located on a coal field and near a large river and will be completely self-sustaining in utilities. It boasts the largest oxygen plant in the world, producing 1,800 tons/day. The Sasol Co. was formed by the South African government for this undertaking and is government directed. M. W. Kellogg Corp. is supervising construction of the plant. E. J. Pyrcioch

Catalyst Handling

Seibert, C. A., Jr. and Cleveland, D. L. HOW TO REDUCE FCCU STACK LOSSES. *Petroleum Refiner*, 33, 189-192 (1954) May.

The Wilmington (Calif.) refinery of Shell Oil Company reduced catalyst stack-loss by regu-

larly removing a portion of the catalyst fines from the electric precipitator hoppers instead of returning these fines to the process. This resulted in an increase in average particle size and a resultant increase in efficiency of the cyclones and precipitator. Catalyst stack losses were maintained below the legal requirement of 40 lbs/hr with a catalyst circulation rate of 3 million pounds per hour. W. G. Bair

Fischer-Tropsch

Basak, N. G. and Bhattacharyya, K. K. FISCHER-TROPSCH SYNTHESIS: A STUDY OF THE REACTION MECHANISM. *J. Inst. Fuel* (British) 27, 195-200 (1954) April.

The progressive change of the composition of the exit gases when the Fischer-Tropsch synthesis reactions are initiated has shown that the equilibrium state is reached on the catalyst surface within a short period. The effects of feed-gas composition, space velocity, and the reduction of the catalyst, on the utilization ratio and the nature of the products are discussed. The results strongly suggest that in the initial stage a predominantly chemisorbed layer of CO is formed on the surface which links up with the atomic hydrogen forming a primary adsorbed complex CO-H. This primary complex covers the active surface. At the completion of this process equilibrium is set up and remains unaltered as the synthesis is continued. The primary CO-H complex acts probably as an intermediate in the synthesis reaction, producing—(CH_2)—radicals which polymerize to form higher hydrocarbons. Thus the synthesis reaction is $CO + 2\ H_2 \rightarrow CH_2 + H_2O$, which corresponds to the results obtained on CO and ni catalysts. With iron catalysts a secondary water-gas shift reaction occurs between the H_2O molecule formed and the chemisorbed CO producing CO_2, and consequently the utilization ratio of H_2 and CO is reduced. The U_{H2}/co value varies inversely as the partial pressure of CO in the feed gas. The methane-forming reaction is considered to be independent of the main hydrocarbon synthesis. It is probably governed by the active points on the metallic surface of the catalyst other than those responsible for the main synthesis, and can be represented as $2\ CO + 2\ H_2 = CH_4 + CO_2$. Authors' Abstract

Oil-Shale Process

Barr, F. T. and Rex, W. A. (assigned to Standard Oil Development Co.) PREHEATING OF OIL-SHALE. U. S. 2,680,091 (1954) June 1.

This invention is concerned with an improved method of preheating subdivided oil shale in a fluidized preheating zone by countercurrent direct contact with hot spent shale fines. Raw oil shale of relatively large particle size (0.5 to 1.5 inches diameter) is charged to top of a vertical treating column having a high ratio of length to diameter. The coarse shale passes downward in direct contact with upflowing distillation products, flue gases and hot fines. The fluidizing gas at a temperature of about 700 to 800° F. would flow upward at superficial velocities of about 0.5 to 3 feet per second, giving up its heat to the descending shale, and exiting at the top at about 100 to 200° F. E. B. Shultz

7. ANALYTICAL METHODS AND TESTS

Carbon-Hydrogen

Cross, C. K. and Wright, G. F. REPLACEMENT OF LEAD PEROXIDE IN CARBON, HYDROGEN MICRODETERMINATION. *Anal. Chem.*, 26, 886-890 (1954) May.

Lead peroxide has been successfully replaced by trishydroxylamine phosphate for removal of nitrogen oxides. Sulfamic acid also has been used but its capacity is low. Elimination of lead peroxide tends to increase the precision for nitrogen-free samples. D. J. Dennison

Catalyst Testing

HOW A CLOSE CHECK ON YOUR CATALYST CAN IMPROVE FLUID CAT CRACKER OPERATION. *Oil Gas J.*, 52, 86-93 (1954) May 3.

Activity tests and particle-size distribution tests, along with routine analytical tests and product inspection data, can often help the refiner who uses the fluid catalytic cracking process to: cut down on excessive catalyst loss; correct conditions leading to after-burning; improve product distribution; regenerate catalyst more evenly, completely, and effectively; increase gasoline yield. In addition, inspection of test results can often show the refiner when he is headed for trouble. Author's Abstract

Combustion Gases

Egerton, A. C., Everett, A. J., Minkoff, G. J., Rudrakanchana, S. and Salooja, K. C. THE ANALYSIS OF COMBUSTION PRODUCTS. I. SOME IMPROVEMENTS IN THE METHODS OF ANALYSIS OF PEROXIDES. *Anal. Chim. Acta*, **10**, 422-428 (1954) May.

The conditions for the estimation of peroxides by three established methods have been re-examined in detail. 1) It is shown that the reduction of organic hydroperoxides by stannous chloride (Barnard and Hargrave method) can be carried out quantitatively and rapidly in alkaline solution. The advantages of this modification are discussed. 2) The exact conditions are described for accurately measuring the concentrations of hydrogen peroxide and of the lower organic peroxides by the thio-cyanate method. Amyl alcohol is recommended as a decolorizer for the reagent since the red color produced by the action of the peroxides is stabilized, permitting accurate spectrophotometric measurements. Using this reagent, 0.03 micrograms of peroxide per ml can be estimated. 3) The limits of the titanous sulphate method of estimating hydrogen peroxide have been determined and a method suitable for the determination of 0.3 micrograms of hydrogen peroxide per ml is described. Authors' Abstract

Egerton, A. C., Minkoff, G. J. and Salooja, K. C. THE ANALYSIS OF COMBUSTION PRODUCTS. II. THE ESTIMATION OF TRACES OF METHANOL IN THE PRESENCE OF FORMALDEHYDE. *Anal. Chim. Acta*, **10**, 523-525 (1954) June.

In the analysis of combustion products, the estimation of traces of methanol can be rendered difficult by the presence of excess formaldehyde. A method is described for separating the formaldehyde from methanol by treating the solution with sodium bisulphite, and then carrying out a chromatographic separation on filter paper. Ether carries the methanol to the end of the strip, leaving behind formaldehyde and hydrogen peroxide. The paper is cut into pieces, which are separately extracted with water, and the solution oxidised. The formaldehyde so formed is estimate in the usual way with chromotrophic acid. Authors' Abstract

Crude Oil Method

Smith, H. M. and Ball, J. S. CRUDE OIL CHARACTERIZATION BY THE BUREAU OF MINES ROUTINE METHOD. *Petroleum Eng.*, **26**, C-12-14 (1954) June.

This is the first of a series of articles to discuss this routine method which was developed in 1915-20 and which has not greatly changed since then. The method is briefly outlined and the usefulness of the Correlation Index is described. E. B. Shultz

Dissolved Water

Clark, F. M. (assigned to General Electric Co.) MEASUREMENT OF DISSOLVED WATER CONTENT OF LIQUIDS. U. S. 2,679,027 (1954) May 18.

This patent concerns the measurement of dissolved water in liquids, utilizing the surface resistance of the inter-electrode surface of a glass plate immersed in the liquid to be measured, comparison with a standard liquid forming the basis for the water content evaluation. Convenience, accuracy and rapidity are claimed. R. F. Bukacek

Gas Specific Gravity

Willard, B. J. SPECIFIC GRAVITY OF GASES. *Instrum. and Automation*, **27**, 945-949 (1954) June.

This important résumé presents six basic methods for measuring specific gravity of gases, including principle, technique, accuracy, and operational considerations. Two techniques (direct weighing and gas balance) are basic; the other four (effusion, viscous drag, kinetic pressure increase, and air-column weighing) must be calibrated against gases of known specific gravity. Author's Abstract

Hydrocarbon Determination

Charlet, E. M., Lanneau, K. P. and Johnson, F. B. ANALYSIS OF GAS OIL AND CYCLE STOCK FROM CATALYTIC CRACKING. *Anal. Chem.*, **26**, 861-71 (1954) May.

A chromatographic technique is described for a type separation of the polynuclear aromatic hydrocarbons found in heavy gas oils and cycle oil. Use of fractional adsorption column is

discussed, as is use of ultra-violet absorption spectra for identification of the polynuclear aromatic types found in the chromatographic fractions. A method utilizing infrared absorption data, molecular weight, and carbon-hydrogen determinations in conjunction with the chromatographic separations and ultraviolet absorption spectra is applied in the quantitative analysis of the aromatic fractions from a heavy gas oil and heavy catalytic cycle oil. The compositions are presented in terms of the weight per cent of each molecular type found in the aromatic portions of the oils. The types are classified on the basis of the configuration of the aromatic rings in the molecules. Further data are presented to show the average weight per cent of aromatic rings in each of the molecular types found in the gas oil and cycle oil.

Authors' Abstract

Tenney, H. M. and Sturgis, F. E. SEPARABILITY OF HYDROCARBONS BY ELUTION CHROMATOGRAPHY. *Anal. Chem.*, **26**, 946-953 (1954) June.

A method has been applied for establishing quantitatively the relative adsorbabilities of hydrocarbons according to molecular type on various solid adsorbents. Analytical separations on a practical scale have been shown to be feasible. D. J. Dennison

Scholz, H. BEITRAG ZUR BESTIMMUNG DER SCHWEREN KOHLENWASSERSTOFFE UND DES UNTEREN HEIZWERTES VON GASGEMISCHEN. (CONTRIBUTION TO THE DETERMINATION OF HEAVY HYDROCARBONS AND LOWER HEATING VALUE OF GAS MIXTURES.) *Gas- und Wasserfach* (German) **95**, 15-22 (1954) January 1.

From an Orsat analysis and a heating value determination it is possible to split the determined total unsaturated hydrocarbons into ethylene and propylene and to split the saturated hydrocarbons into methane, ethane, and propane. With the help of these values it is possible to calculate the lower heating value with sufficient accuracy. The procedure is illustrated with examples of coal generator-gas and coke-oven gas. The reliability of the hydrocarbon-splitting product depends a great deal on the kind of sample as well as on the Orsat analysis and the heating value determination. In order to assure the reliability of the sampling, a sufficient volume of sample, and to allow taking the sample at any desired place in the plant, a sampling apparatus was developed. The method for differentiating the hydrocarbons, and the new sampling apparatus appear to be equally important for special investigation and for plant operating control.

Author's Abstract

Solids Analysis

Hannay, N. B. and Ahearn, A. J. MASS SPECTROGRAPHIC ANALYSIS OF SOLIDS. *Anal. Chem.*, **6**, 1056-1058 (1954) June.

Discussion of qualitative, semi-quantitative, and quantitative detection of surface and trace contamination on and in solids. Photographic detection seems more sensitive then the electrical system but does not provide visual information while the unit is in operation. Concentrations as low as 10^{-7} for most elements and 0.1 monolayer can be detected. R. R. Amrine

Specific Heat

Hirone, T., Maeda, S., Tsubokawa, I. and Tsuya, N. THE AUTOMATIC MEASUREMENT OF SPECIFIC HEAT. *Eng. Digest* (British), **15**, 239-240 (1954) June.

A method for the automatic measurement and recording of the specific heat of alloys and compounds. The method has been used successfully for the thermal analysis of various ferro magnetic compounds and binary superlattice alloys. The apparatus is fully described with both its faults and possibilities. R. R. Amrine

Sulfur Determination

Bartlett, J. K. and Skoog, D. A. COLORIMETRIC DETERMINATION OF ELEMENTAL SULFUR IN HYDROCARBONS. *Anal. Chem.*, **26**, 1008-1011 (1954) June.

Elemental sulfur in hydrocarbons may be determined to a sensitivity of 2 ppm using the reaction of sulfur with cyanide in acetone solution. The thiocyanate formed may be determined colorimetrically by the addition of an acetone solution of ferric chloride. E. Mann

Jones, A. S. and Letham, D. S. A SUBMICRO METHOD FOR THE ESTIMATION OF SUL-

PHUR. *Chem. Ind.* (British) No. 23, 662-663 (1954) June 5.

Determination of sulfate by precipitation with 4-chloro-4′ aminodiphenyl, and determination of unused reagent by ultraviolet absorption is described. Sulfate concentration in the 0.001 M range, and amounts of solution as low as 1 ml can be determined. D. M. Mason

8. GENERAL AND PHYSICAL CHEMISTRY

Carbon Activation

Lewis, W. K. and Metzner, A. B. ACTIVATION OF CARBONS. *Ind. Eng. Chem.*, 46, 849-858 (1954) May.

A higher yield, and improved adsorption properties of an activated carbon is obtained by deviating from the standard procedure of activating carbon with steam and using sulfur vapors instead as the reagent. By this method a fluidized reactor bed may be used which has the added advantage of complete contact of the reactant gas with charcoal as well as a more precise temperature control. S. Mori

Gas Viscosity

Westmoreland, J. C. DETERMINATION OF VISCOSITY OF EXHAUST-GAS MIXTURES AT ELEVATED TEMPERATURES. Nat. Adv. Comm. Aeron., Tech. Note 3180 (1954) June.

Mixtures containing N_2, CO_2, O_2, A, and H_2O were investigated at approximately atmospheric pressure and from 0°-1,100° C. The capillary tube was coiled rather than straight. The pressure drop and volumetric flow rate were measured, thus, the viscosity was calculated using the Hagen-Poiseuille equation with a slip correction. Gas mixtures containing water were saturated at room temperature. The effect of temperature was evaluated using the Sutherland expression. Tables and graphs are included. W. W. Clauson

Graphite Structure

Bacon, G. E. THE (hki) REFLEXIONS OF GRAPHITE. *Acta Cryst.* 7, 359-361 (1954) April 10.

The randomness of a graphite structure may be compared by measuring the interlayer distances using X-rays and theoretical calculations of the results. S. Mori

Liquid Densities

Sims, R. P. SOME OBSERVATIONS ON DETERMINING DENSITY OF FLUIDS BY THE FALLING DROP METHOD. *Can. J. Chem.*, 32, 506-11 (1954) May.

The use of the falling drop method for the determination of liquid densities has been investigated for liquids of various viscosities and surface tensions in media of varying solvent power. Relationships between the size, shape, and velocity of the drops and the physical properties of the systems have been discussed qualitatively. Data are given to show the wall effect and end effect of the container on the motion of the drops. S. Hu

Molecular Transport

Johnson, E. F. MOLECULAR TRANSPORT PROPERTIES OF FLUIDS. *Ind. Eng. Chem.*, 46, 889-893 (1954) May.

This review covers papers published during 1953; both experimental and theoretical work are included, non-Newtonian fluids are not included. An extensive bibliography is presented. W. W. Clauson

The following article, the abstract for which appears on the page indicated, is also called to your attention:

N. B. Standards. ENERGY TRANSFER IN HOT GASES. p. 152

9. ORGANIC CHEMISTRY

Aromatic Sulfides

Birch, S. F., Dean, R. A., and Whitehead, E. V. PREPARATION AND PHYSICAL PROPERTIES OF SULPHUR COMPOUNDS RELATED TO PETROLEUM. PART III. SEMI-AROMATIC SULPHIDES. *J. Inst. Petroleum* (British), 40, 76-85 (1954) March.

The synthesis, characterization, and physical properties of four typical bicyclic monosulphides in a high state of purity is described, these compounds consist of an aromatic nucleus fused either to a five- or six-membered fully saturated sulphur-containing ring, and include 1- and 2-thiaindane 1- and 2-thiatetralin. The reactions of these sulphides with several reagents are described. Authors' abstract

Chemical Manufacture

Dotterweich, F. H. TEXAS IN TOP SPOT IN PETROCHEMICALS MANUFACTURE—HERE'S WHY. *Oil Gas J.*, 53, 170-172, 260, 261 (1954) May 24.

With its ready source of natural gas as a raw material and fuel, Texas, especially the Gulf Coast region, has claimed the majority of developments in the petrochemical industry. The author surveys the factors which make this area attractive to petrochemical plants and expresses a belief of continued concentration in plant build-up in the Texas region. J. M. Reid

10. CHEMICAL ENGINEERING

Air-Cooled Exchangers

Homer, C. H., Jr. and Kopp, S. AIR-COOLED HEAT EXCHANGERS. *Petroleum Eng.*, 26, D27, 28, 30, 32, 34 (1954) April.

Air-cooled heat exchangers are most economical in localities where there is a shortage of cooling water. In the past 15 years units using mechanical air circulation have been developed to replace the older type using natural draft, thus improving the performance under better controlled conditions. A great variety of designs is available on the market and proper choice will depend on particular economic factors. This type of heat exchanger has found wide application in the gas industry. S. Hu

Applied Statistics

Shewell, C. T. STATISTICS FOR EVERYDAY USE. *Petroleum Processing*, 9, 524-28 (April); 696-703, May; 894-99 (1954) June.

Properly used, statistics can be a powerful tool in solving many perplexing problems in refinery and petrochemical processing plant operations. Statistics can be applied with success to engineering, to research and development, to purchasing, and many other activities, in addition to manufacturing. The measures of central tendency, measures of dispersion, and discarding of bad data were covered in the first article. The second covers: the "Student's 't' test, the least squares curves, and propagation of error. The final installment covers the techniques of analysis of variance, fitting the best curve, and standard error of estimate. Useful tables and practical examples are included with this clear and simple explanation to aid in its application to plant problems. B. E. Eakin

Dust Removal

Egleson, G. C., Simons, H. P., Kane, L. J. and Sands, A. E. MOVING COKE-BED GAS FILTER FOR DUST REMOVAL. U.S. Bur. Mines Rpt. Inv. 5033 (1954) February; *Ind. Eng. Chem.*, 46, 1157-1162 (1954) June.

Results are presented of the operation on a small pilot-plant scale of a moving coke-bed filter for the removal of dust in synthesis gas produced from coal by the Bureau of Mines. Dust-laden coke is withdrawn through a grate at the bottom of the coke-bed column, washed and recycled to the top of the column without interrupting the gas flow. Use of a water spray at the top of the column improved the filter efficiency. The unit was operated at pressure drops of 3.5 in H_2O across the bed with efficiencies of 96.4 to 99.8% dust removed. Negligible coke attrition losses were experienced.

E. J. Pyrcioch

Equilibrium

Corrigan, T. E. CHEMICAL ENGINEERING FUNDAMENTALS. CHEMICAL EQUILIBRIUM-IV. *Chem. Eng.*, 61, 244, 46, 48 (1954) June.

A short discussion is presented on the calculation of flame temperatures, followed by a definition of dissociation and methods of expressing activities in ideal and non-ideal solutions.

C. G. von Fredersdorff

Gas Absorption

Long, R. GAS ABSORPTION. *Chem. and Process Eng.*, (British), 35, 141-146 (1954) May.

At the symposium on gas absorption held at Birmingham University, England, in April, 1954, most of the papers dealt with some aspects of absorption of carbon dioxide by such absorbents as ethanolamines, alkali solutions, and water. Apparatus used by various investigators included centrifugal absorbers, spray towers, and packed columns. Special topics dealing with ammonia absorption, dehumidification, pressure drop in absorber, absorption from single bubbles, and kinetics of the liquid-gas absorption process were also covered in a few papers. S. Hu

Residence Time

Danckwerts, P. V., Jenkins, J. W. and Place, G. THE DISTRIBUTION OF RESIDENCE-TIMES IN AN INDUSTRIAL FLUIDISED REACTOR. *Chem. Eng. Science* (British), 3, 26-35 (1954) February.

The distribution of residence-times of the gas flowing through a fluidised catalyst regenerator has been determined by using helium as a tracer. Only about 5% of the gas spends less than half, and about 5% more than twice, the mean residence-time in the regenerator. It appears that the flow through the fluidised bed itself is much closer to piston-flow than to complete mixing, the hold-back being less than 0.1. Authors' Abstract

Sedimentation

Richardson, J. F. and Zaki, W. N. THE SEDIMENTATION OF A SUSPENSION OF UNIFORM SPHERES UNDER CONDITIONS OF VISCOUS FLOW. *Chem. Eng. Science* (British), 3, 65-73 (1954) April.

The dynamic equilibrium of a suspension of uniform spherical particles settling in a fluid has been considered, and an expression has been obtained for the drag force on a constituent particle. This has been expressed in the form of a correction factor to be used in conjunction with Stokes' Law, and has been compared with the correction factor obtained from experimental measurement. Two configurations of particles have been considered and good agreement has been obtained between the theoretical and experimental correction factors at volumetric concentrations greater than about 0.05, though the correction factor extrapolates to zero, corresponding to zero drag on the particle, at infinite dilution. The reasons for this discrepancy are discussed. Authors' Abstract

Shot Preheating

Tyson, C. W., Nicholson, E. W. and Gornowski, E. J. MODEL II FLUID HYDROFORMER USES SHOT-CATALYST PRINCIPLE. *Oil Gas J.*, 53, 122, 124-26 (1954) May 17.

An inert material more dense than the catalyst and of larger size is used to convey the heat of regeneration into the reactor of a fluid hydroformer. The material is referred to as "shot". The fact that shot and catalyst together can convey all of the available heat of regeneration into the reactor results in a considerable reduction in the heat required from the recycle-gas stream. Investment savings in compression, furnaces, heat exchangers, cooling water, and power are realized. In addition, a lower recycle-gas preheat temperature permits combining the naphtha feed and recycle gas so that all of the preheating can be done in a single train of exchangers. H. A. Dirksen

11. PROCESS EQUIPMENT AND INSTRUMENTATION

Gas Mixing Control

Bailey, S. W. AN APPARATUS FOR PRODUCING A NUMBER OF DIFFERENT GAS MIXTURES FOR A LONG PERIOD OF TIME. *J. Sci. Instruments*, 31, 93-95 (1954) March.

An apparatus is described which provides a flowing gas mixture of accurately controlled composition over a long period of time. The apparatus is suitable for a total gas flow of 10 ml per min. and can be modified to introduce any desired number of compounds to the mixture. D. M. Mason

Gas Plant Ancillaries

Pollard, R. ANCILLARY PLANT FOR THE GAS INDUSTRY. *Gas World* (British) *Suppl.* 95-100 (1954) May 1.

Conventional practices and recent developments in the treatment of manufactured gas have been critically reviewed from a chemical engineering point of view. Special affection has been given to the theoretical design and actual operation of various types of tube condensers, multistage static amononie washers, and iron box hydrogen sulfide purifiers. Pertinent references are cited. S. Hu

X-Ray Camera

Owen, E. A., and Williams, G. I. A LOW-TEMPERATURE X-RAY CAMERA. *J. Sci. Instruments* (British), 31, 49-54 (1954) February.

An X-ray camera for examination of small plates at low temperatures is described. Through a copper-constantan thermocouple, the

temperatures are measured for a range of from 20° down to —194° C. (liquid air temperatures). The sample, while rotating, is cooled in a stream of air, or by dropping liquid air on it. Results for the tested metals, iron and silver, and the thermal expansion equations are given and discussed. S. Sensi

12. MATERIALS OF CONSTRUCTION

Aluminum Gas Pipe

Grant, W. C. NEW 8⅝-IN., 12-MILE LINE IS LAID WITH ¼-IN. WALL ALUMINUM PIPE. *Gas Age*, 113, 25, 26 (1954) April 8.

A new 8⅝-in., 12-mile long all-aluminum pipeline of ¼-in. wall has been inaugurated to carry gas from the East White Point gas field of Texas to the Reynolds plant at La Quinta. It is light-weight, non-corrosive, of smooth inside surface (reducing pressure drop) and requires lower maintenance costs. The welded sections withheld pressures up to 1800 psi and were speedily done by the new Aircomatic portable welder, also illustrated. A. J. Tulis

Slocum, B. ALL-ALUMINUM GAS LINE IS UNIQUE INSTALLATION. *Petroleum Eng.*, 26, D48-50 (1954) May.

A description of the 12 mile, 8 inch gas line of aluminum pipe recently completed in South Texas. This line was designed for 500 psi operating pressure and tested to 1000 psi. The key to its construction is a new automatic welding machine using a metallic-arc process.
R. F. Bukacek

Ceramic Coatings

JET ENGINE PARTS NEED CERAMIC COATINGS. *Ind. Gas*, 32, 11 (1954) March.

The wide field of ceramics in industry has been extended to include protecting jet engines from the intense heat generated in their operation. In one particular instance an increase of 100° F. in manifold temperature shortened the life of the alloy used from 300 hrs. to 20 min. because of the extremely high rate of carbon absorption at high temperatures and the resulting surface embrittlement. A coating of ceramic material prevents this absorption. Other interesting applications in this field are described along with some advantages of gas-fired equipment for applying these coatings.
R. T. Ellington

Heat-Resistant Alloys

HIGH ALLOY CASTINGS IN NEW EQUIPMENT HELP STEEL INDUSTRY EXPANSION. *Ind. Gas*, 32, 3, 4, 22-24 (1954) April.

Increased use of high alloy castings is accelerating the steel industry's program of expansion and modernization. Among the uses described are HH grade alloy for soaking-pit cover seal castings and furnace dampers. Type HT alloy castings have been used to replace water-cooled skids in billet reheating furnaces, HH alloy radiant tubes for sheet and bar annealing and HH alloy containers for lead-bath wire treating. The advantages of metal alloy recuperators over ceramic recuperators are also discussed to some extent. R. T. Ellington

Plastics Fabrications

Huscher, J. L. FABRICATION AND USE OF RIGID POLYVINYL CHLORIDE PLASTICS. *Materials and Methods*, 39, 119-134 (1954) June.

This article is a comprehensive presentation of the fabrication and use of unplasticized polyvinyl chloride plastics. Physical and chemical properties, machining and cutting, forming and joining methods, and design suggestions are discussed completely, with illustrations, graphs, and tables. A. J. Tulis

Refractories

Blaha, E. HOW TO SELECT REFRACTORY MATERIALS. *Ind. Gas*, 32, 9, 10, 18-24 (1954) March.

The use of gas in industrial furnaces simplifies the selection of the materials employed to contain heat since certain harmful effects of less refined fuels may be entirely disregarded. The short heat-up times possible because of the rapid heat release with gas, however, necessitate consideration of the expansion characteristics of refractory materials. A good general discussion of the physical and chemical characteristics of the common refractories is presented. R. T. Ellington

Water Tank Corrosion

Weast, R. C. CORROSION OF GALVANIZED STEEL HOT WATER STORAGE TANKS AS A FUNCTION OF SOME SERVICE VARIABLES. Am. Gas Assoc., Domestic Gas Research Project DJ-3-WH (1954) February.

Research was conducted on eighteen thirty-gallon galvanized steel underfired automatic hot-water storage heaters. The variables were quantity of hot water withdrawn from each tank per day, rate of heating the water and temperature for storage of water in the tanks. All tests were conducted with sodium zeolite softened Cleveland tap water. Extent of corrosion was determined by measurement of pit depths and by determination of zinc, iron and dissolved oxygen contained in the water entering and leaving each of the tanks. In addition, photographs were taken of the tank interiors during regular intervals throughout the test period. Results of the experiments indicate conclusively that the temperature of the water stored in the tanks was the most significant factor contributing to the corrosion rate of the tanks. Author's Abstract

13. NEW BOOKS

Flame Research

ENERGY TRANSFER IN HOT GASES. (Sixth Symposium, Sept. 17-18, 1951) Nat. Bur. Standards Circ. 523, March 10, 1954.

Collected papers at the sixth symposium of a series of twelve conferences held at the NBS in 1951 are presented. A. G. Gaydon (pp. 1-8) discusses electronic excitation in flames, covering possible mechanisms and processes. George A. Herman (pp. 9-18) describes a low-pressure-high-intensity method of excitation for high dispersion work on bands with complex structure, eliminating overlapping of spectra. P. J. Dyne (pp. 19-22) describes some studies of hot gases by a fluorescence method of excitation. H. P. Broida (pp. 23-34) measures the temperature of flames by OH rotation intensity distribution with a photoelectric recording monochromater. The spectra are in the ultraviolet and visible spectrum. S. S. Penner, M. Gilbert, and D. Weber (pp. 35-37) discuss a method of excitation using gases at low pressure, but the gases give a very high intensity spectrum. G. H. Dieke and H. M. Crosswhite (pp. 39-49) discuss corrections and methods of correction for band intensities effected by predissociation, background, and self absorption in emission and absorption of flame and hot gases spectra. Shirleigh Silverman (pp. 51-56) discusses CO distribution in a $CO\text{-}O_2$ flame by temperature measurements using infrared. W. S. Benedict and Earle K. Plyler (pp. 57-74) discuss the emitters in flames in the 1 to 2.6 micron infrared spectra using lead-sulfide photoconductive cells and a 15,000 line per inch grating. Similarities and differences between results in the near infrared and visible and ultraviolet are pointed out. S. S. Penner (pp. 75-85) discusses the theories of emission of diatomic gases in terms of infrared emission. R. H. Tourin (pp. 87-91) discusses a method for thermally exciting gases for emission and absorption work in the infrared. B. Lewis (pp. 92-97) very briefly discusses the present position of the theories of flames pointing up areas, problems, possibilities, and the coverage being given them. K. E. Shuler (p. 98) abstracts his paper which applies the production of $OH(^2\Sigma^+)$ in the $H_2—O_2$ flame to a method for detailed mechanism of elementary reactions. J. R. Arthur and D. T. A. Townend (pp. 99-110) discuss some reactions of atomic hydrogen in flames by means of luminescence of oxides, suggesting a recombination of the hydrogen atoms on the surface of the oxides. The expansion in size of the visible luminous envelope of gas with various additives is briefly discussed pointing out that the extent with sodium salts depends on the nature of the salt. R. H. Wilson, Jr., J. B. Conway, A. Engelbrecht, and A. V. Grosse (pp. 111-118) discuss a hydrogen-fluorine flame study. Theoretical calculations and actual calculations are given with a method of using the sun as a high temperature calibration source. B. Karlovitz (pp. 119-121) discusses how a turbulent flame generates additional turbulence which can help explain heat transfer. The intensity of the turbulence decreases with increasing distance from the flame and probably has negligible influence on the transmission of heat content at lower temperatures. H. K. Sen (pp. 123-126) points out that temperature, to an astrophysicist, is an operational concept dependent on the method of calculation employed.

R. R. Amrine

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Erdöl und Kohle

Faraday Society. Transactions
Fuel
Fuel Abstracts
Fuel Economist
Fueloil and Oil Heat

Gas
Gas Age
Gas and Oil Power
Gas Heat
Gas Journal
Gas News (Chicago)
Gas Council Publications
Gas Times
Gas und Wasserfach
Gas World

Heating and Ventilating
Heating, Piping and Air Conditioning

Independent Petroleum Association of America Monthly
Industrial and Engineering Chemistry
Industrial Finishing
Industrial Gas (American)
Industrial Gas (British)
Industrial Heating
Institute of Fuel (British). Journal
Institute of Petroleum (British). Journal
Institute of Gas Technology Publications
Institution of Gas Engineers. Bulletins, Communications and Transactions
Instruments

Journal des Usines a Gaz
Journal of Applied Chemistry
Journal of Applied Mechanics
Journal of Applied Physics
Journal of Chemical Education
Journal of Chemical Physics
Journal of Engineering Education
Journal of Metals
Journal of Organic Chemistry
Journal of Petroleum Technology
Journal of Physical Chemistry
Journal of Research (National Bureau of Standards)
Journal of Scientific Instruments

Laboratory Practise
LP-Gas

Materials and Methods
Mechanical Engineering
Mining Engineering

National Advisory Committee for Aeronautics, Reports
National Fire Protection Association Quarterly
National Gas Bulletin
National Petroleum News
Nucleonics

Official Gazette of the U.S. Patent Office
Oil and Gas Journal
Oil, Paint and Drug Reporter
Optical Society of America. Journal

Paint and Varnish Production
Petroleum
Petroleum Engineer
Petroleum Processing
Petroleum Refiner
Physical Review
Physics Today
Power Engineering
Public Utilities Fortnightly

Review of Scientific Instruments
Revista dei Combustibili
Revue generale du Gaz

Science
Southern Chemical Industry
Southern Gas Association Progress
Southern Power and Industry
Spectrochemica Acta
Svenska Gasverksföreningen Manadsblad

Technical News Bulletin

U.S. Bureau of Mines. Bulletins, Information Circulars, Reports of Investigations and Technical Papers

World Oil
World Petroleum

THE GAS INDUSTRY'S OWN EDUCATIONAL AND RESEARCH FACILITY